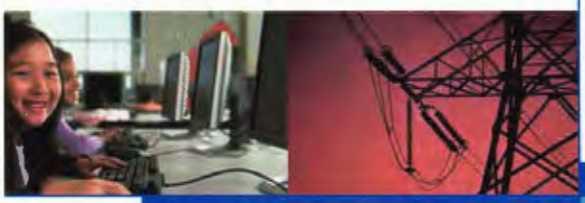
Neil



ONTARIO POWER AUTHORITY

June 29, 2006

Ontario's Integrated Power System Plan

Scope and Overview

OPA
Ontario Power Authority™

ONTARIO'S INTEGRATED POWER SYSTEM PLAN: SCOPE AND OVERVIEW

Introduction

Ontario is approaching the next major milestone in the development of its electricity system: the completion of its Integrated Power System Plan (IPSP).

The IPSP will be a comprehensive plan for Ontario's electricity system. Looking ahead 20 years, it will identify the conservation, generation, and transmission investments that are needed in the next three to five years, indicate the preparatory work required for the subsequent five years, and chart broad directions for the development of the system in the balance of the planning period.

The IPSP will reflect the electricity sector goals set by the Ontario Government and will include programs and activities that respond to the Minister of Energy's directive to the Ontario Power Authority (OPA) on June 13, 2006. Among other things, the directive specifies the relative contributions to be made from conservation and demand management (CDM), renewable generation and conventional sources of supply.

The purpose of the plan is to identify, co-ordinate and schedule the many different investments that are needed to meet Ontario's power requirements. The IPSP will be "integrated" in the sense that it will address both conservation and new supply, and will ensure that generation and transmission investments are looked at together, so that risks, costs and environmental impacts are minimized.

The OPA is statutorily responsible for developing the IPSP and submitting it to the Ontario Energy Board (OEB) for review and approval. By regulation, the OPA is required to consult with consumers, distributors, generators, transmitters and other persons who have an interest in the electricity industry in order to ensure that their priorities and views are considered in the development of the plan.

The purpose of this paper is to initiate a series of consultations that will culminate in an IPSP document and supporting evidence to be submitted to the OEB in early 2007. The paper is organized in two Parts.

Part 1 has four sections, as follows:

- Section 1.1 explains the purposes of the IPSP, focusing on the requirements that are set out in the legislation and regulations.

- Section 1.2 describes the regulatory review process for the IPSP.
- Section 1.3 describes the stakeholder engagement process that the OPA proposes for exchanging information and ideas over the coming months.
- Section 1.4 proposes a set of planning principles to guide the development of the IPSP.

Part 2 identifies eight broad priorities for the IPSP and discusses some of the implementation challenges in each area that will shape the content of the plan. The eight broad priorities are:

- Overcoming the Infrastructure Deficit
- Maximizing the Benefits of Conservation and Demand Management
- Integrating Renewable Resources
- Proceeding with Nuclear Investments
- Replacing Coal
- Enhancing Transmission
- Providing Reliable Service to Growing Areas of Ontario, and
- Exploring Options for Sector Development.

The one-by-one presentation of planning challenges in Part 2 is intended to facilitate a focused discussion of the "building blocks" of the IPSP. As the consultation proceeds, additional papers will be available on the issues, highlighting linkages and tradeoffs, and leading to the development of integrated solutions that are environmentally sustainable.

Part 1. The Integrated Power System Plan

Ontario has not prepared a comprehensive power system plan in over 15 years. The restructuring of the electricity industry that has taken place since the late 1990s means that integrated planning for the industry will be different in style and scope from what it was in the past.

The OPA is not an integrated utility planning its own business. It is the province's planning authority for electricity, charged with developing an integrated plan for the entire electricity system in Ontario. The OPA has no commercial interest in any specific projects; its sole objective is to plan a system that delivers the best outcome for Ontario consumers based on the policy guidelines it has been given. Moreover, government regulation requires the OPA to update the IPSP and the OEB to review and approve it on a regular basis to ensure that it continues to meet specified criteria.

This part of the paper provides an overview of what the IPSP is designed to accomplish and how the OPA intends to work with Ontario electricity consumers and stakeholders to develop the plan. It also includes two items for early discussion: a statement of proposed planning principles and an overview of key challenges.

1.1 Purpose of the IPSP

1.1.1 Background

In the fall of 2002, Ontario received the stark warning from the independent Market Surveillance Panel that it faced a serious shortage of generation capacity.[1] The Government appointed the Electricity Conservation and Supply Task Force (ECSTF) in June 2003. Its report in early 2004 called for an "action plan for attracting new generation, promoting conservation and enhancing the reliability of the transmission grid." In addition, the ECSTF report concluded that "the market approach adopted in the late 1990s needs substantial enhancement if it is to deliver the new generation and conservation Ontario needs, within the timeframes we need them." The ECSTF recommended that a long-term planning function be created to develop integrated power system plans to meet Ontario's electricity requirements.[2]

In late 2004, the Ontario Legislative Assembly passed the *Electricity Restructuring Act, 2004*, making three critical changes in the institutional arrangements of the sector with respect to long-term planning. In the legislation,

- the OPA was given the mandate both to develop an integrated power system plan and to address the looming supply–demand imbalance through conservation and generation procurements
- the Government was given the discretion to determine the future "supply mix" for the province as a starting point for the IPSP
- the OEB was given the authority to review and approve the IPSP.

The new "sector model" established by the *Electricity Restructuring Act, 2004*, recognizes that a formal, overall plan can help create the big-picture certainty that investors and other decision makers require and that it can lead to better co-ordination of major projects. As the current supply-demand imbalance is gradually resolved, market-based mechanisms could take the place of OPA procurement, with the OPA retrenching to being a supplier of last resort. Should this occur, the nature and scope of long-term integrated planning would change as well.

The adoption of an "integrated" approach to planning recognizes that it is necessary to act effectively on both the demand and supply sides of the power equation and with full appreciation of the environmental consequences of every decision. "Integrated" planning also recognizes that modern electricity networks are complex engineering achievements, and that every change, such as the addition of a new generator or transmission line, has to be evaluated in terms of its impact on the reliability and security of the system as a whole. Whether on the demand or supply side, a key purpose of planning is to guide the actions of many different and diverse electricity system participants.

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[1] Market Surveillance Panel Report, May – August 2002, October 7, 2002, pp. 131-32. http://www.oeb.gov.on.ca/documents/msp/panel_mspreport_imoadministered_071002.pdf

[2] Electricity Conservation and Supply Task Force, *Tough Choices: Addressing Ontario's Power Needs. Final Report to the Minister*. January, 2004, pp. i, 1, and 3. http://www.energy.gov.on.ca/english/pdf/electricity/TaskForceReport.pdf

1.1.2 The Legislative Requirements

The legislative framework for the IPSP and procurements are found in Section 25.30 and 25.31, respectively, of the *Electricity Act, 1998* (as amended by the *Electricity Restructuring Act, 2004*) and Ontario Regulations 424/04 (as amended) and 426/04, respectively. The legislation requires the OPA to develop and submit an integrated power system plan to the OEB once during each period set out in regulations or more frequently if required by the Minister or the OEB.

Section 25.30(1) states that the IPSP is to be designed to assist the Government of Ontario achieve certain of its goals through the effective management of electricity supply, transmission, capacity and demand, and should encompass other related matters as may be prescribed by the regulations. The goals that the IPSP is to assist in achieving are related to the adequacy and reliability of electricity supply, including electricity supply from alternative energy sources and renewable energy sources, and demand management.

Figure 1.1 – Requirements of the IPSP in Regulations

- Consult with consumers, distributors, generators, transmitters and other persons who have an interest in the electricity industry in order to ensure that their priorities and views are considered in the development of the plan
- Identify and develop innovative strategies to accelerate the implementation of conservation, energy efficiency and demand management measures
- Identify opportunities to use natural gas in high efficiency and high value applications in electricity generation
- Identify and develop innovative strategies to encourage and facilitate competitive market-based responses and options for meeting overall system needs
- Identify measures that will reduce reliance on procurement
- Identify factors that it must consider in determining that it is advisable to enter into procurement contracts
- Ensure that safety, environmental protection and environmental sustainability are considered in developing the plan
- Ensure that there is a sound rationale for each electricity project recommended, including an analysis of the environmental impact of the project and the alternatives considered.

Source: OPA; Appendix 1 contains excerpted text of the statute and regulations.

Section 25.30(2) establishes the Minister of Energy's authority to issue directives to the OPA regarding the goals to be achieved during the period of the plan. Goals specifically mentioned are those related to the future mix of energy sources and generation technologies, increases in generating capacity from alternative and renewable energy sources, the replacement of coal-fired generation, and the development and implementation of conservation measures, programs and targets on a system-wide basis or in particular service areas.

Section 25.30(4) requires the OEB to review the plan prepared by the OPA. The OEB must ensure that the plan complies with any directions issued by the Minister and is economically prudent and cost effective. The OEB does not, therefore, have the mandate to revisit the policy decisions of the Government as issued through directives. Under section 25.30(5), the OEB may only approve the plan or refer it back to the OPA with comments for resubmission.

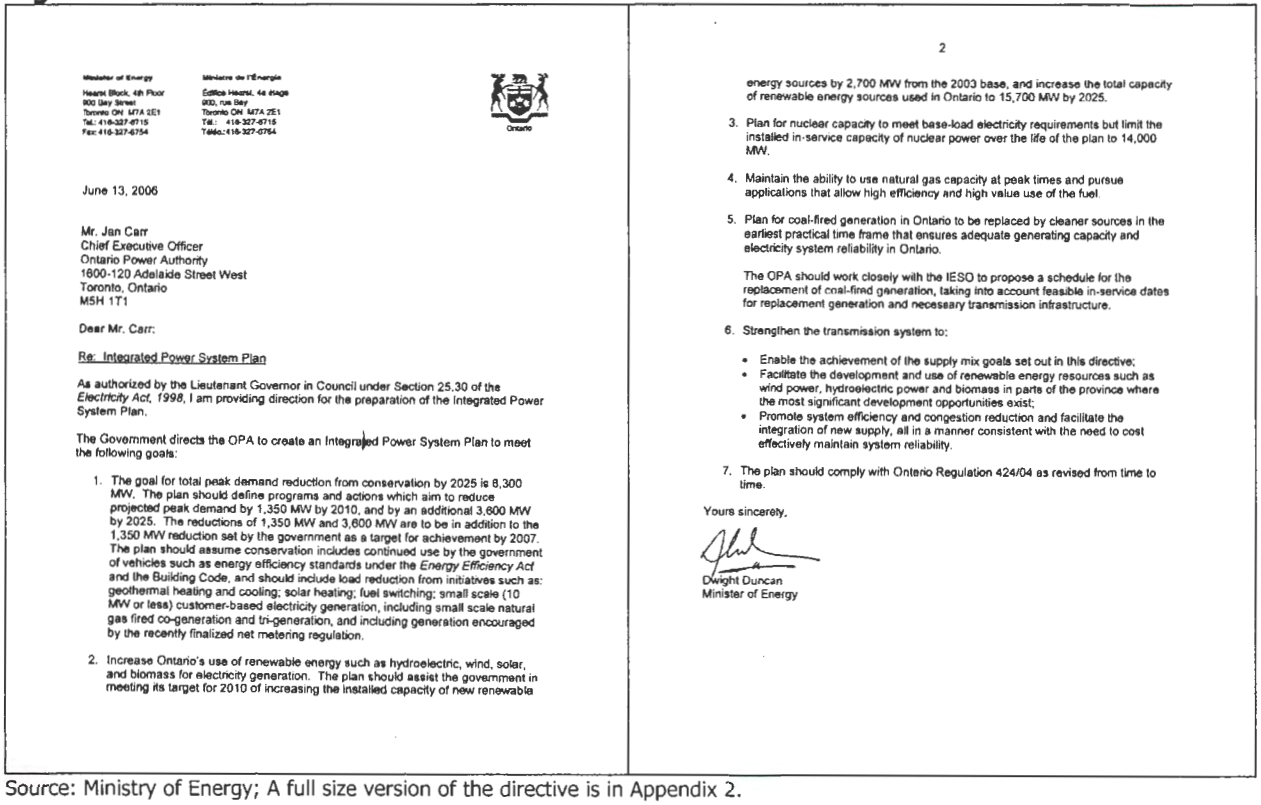
Ontario Regulation 424/04 (as amended) states that the IPSP is to be for a 20-year period and that an update of the plan is to be filed every three years with the OEB and outlines a detailed list of requirements for the plan. Figure 1.1 lists these requirements.

With respect to procurement, Section 25.31 of the Act requires the OEB to approve OPA processes for procuring CDM and supply in accordance with the approved plan. The OPA intends to apply to the OEB for approval of its proposed procurement processes at the same time as it submits the IPSP for approval.

1.1.3 Ministerial Instructions

There have been three major developments since the completion of the legislation and regulations.

Figure 1.2 – Ministerial Directive re. IPSP



Minister of Energy
Hearst Block, 4th Floor
900 Bay Street
Toronto ON M7A 2E1
Tel.: 416-327-6715
Fax: 416-327-6754

Ministre de l'Énergie
Édifice Hearst, 4e étage
900, rue Bay
Toronto ON M7A 2E1
Tél.: 416-327-6715
Téléc.: 416-327-6754

Ontario

June 13, 2006

Mr. Jan Carr
Chief Executive Officer
Ontario Power Authority
1600-120 Adelaide Street West
Toronto, Ontario
M5H 1T1

Dear Mr. Carr:

Re: Integrated Power System Plan

As authorized by the Lieutenant Governor in Council under Section 25.30 of the *Electricity Act, 1998*, I am providing direction for the preparation of the Integrated Power System Plan.

The Government directs the OPA to create an Integrated Power System Plan to meet the following goals:

1. The goal for total peak demand reduction from conservation by 2025 is 8,300 MW. The plan should define programs and actions which aim to reduce projected peak demand by 1,350 MW by 2010, and by an additional 3,600 MW by 2025. The reductions of 1,350 MW and 3,600 MW are to be in addition to the 1,350 MW reduction set by the government as a target for achievement by 2007. The plan should assume conservation includes continued use by the government of vehicles such as energy efficiency standards under the *Energy Efficiency Act* and the Building Code, and should include load reduction from initiatives such as: geothermal heating and cooling; solar heating; fuel switching; small scale (10 MW or less) customer-based electricity generation, including small scale natural gas fired co-generation and tri-generation, and including generation encouraged by the recently finalized net metering regulation.
2. Increase Ontario's use of renewable energy such as hydroelectric, wind, solar, and biomass for electricity generation. The plan should assist the government in meeting its target for 2010 of increasing the installed capacity of new renewable

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energy sources by 2,700 MW from the 2003 base, and increase the total capacity of renewable energy sources used in Ontario to 15,700 MW by 2025.

3. Plan for nuclear capacity to meet base-load electricity requirements but limit the installed in-service capacity of nuclear power over the life of the plan to 14,000 MW.
4. Maintain the ability to use natural gas capacity at peak times and pursue applications that allow high efficiency and high value use of the fuel.
5. Plan for coal-fired generation in Ontario to be replaced by cleaner sources in the earliest practical time frame that ensures adequate generating capacity and electricity system reliability in Ontario.

   The OPA should work closely with the IESO to propose a schedule for the replacement of coal-fired generation, taking into account feasible in-service dates for replacement generation and necessary transmission infrastructure.
6. Strengthen the transmission system to:
   - Enable the achievement of the supply mix goals set out in this directive;
   - Facilitate the development and use of renewable energy resources such as wind power, hydroelectric power and biomass in parts of the province where the most significant development opportunities exist;
   - Promote system efficiency and congestion reduction and facilitate the integration of new supply, all in a manner consistent with the need to cost effectively maintain system reliability.
7. The plan should comply with Ontario Regulation 424/04 as revised from time to time.

Yours sincerely,

Dwight Duncan
Minister of Energy

Source: Ministry of Energy; A full size version of the directive is in Appendix 2.

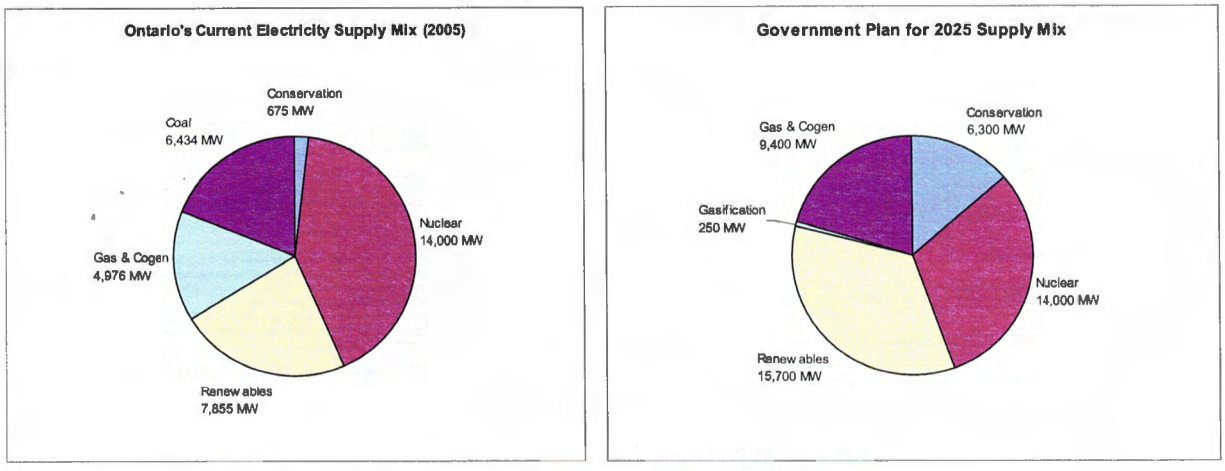
On May 2, 2005, the Minister of Energy, the Hon. Dwight Duncan, wrote to the OPA's CEO and Board of Directors requesting that the OPA begin the process of developing an Integrated Power System Plan. The Minister noted that the task "will be of historic importance" and "will provide a crucial foundation for a clean, reliable, diverse and sustainable electricity supply for the province". In order to assist the Government in setting the goals and directives to be incorporated into the eventual plan, the Minister requested a report and recommendations from the OPA on the future supply mix.

On December 9, 2005, the OPA delivered its *Supply Mix Advice Report* to the Minister. The research conducted for this report remains a valuable resource for the development of the IPSP. Stakeholders and interested consumers are encouraged to review this work, which is available on the OPA website (www.powerauthority.on.ca).

On June 13, 2006, following consultations with the public, stakeholders and the electricity industry, the Minister formally responded to the recommendations in the OPA's report. The text of the Minister's directive is in Figure 1.2.

In the directive, the Minister sets out the goals the OPA is to achieve in the IPSP, including fixed amounts for CDM, renewable resources, and sets a ceiling on nuclear. The IPSP will be a plan to implement the directive. The representation of the supply mix illustrated in Figure 1.3 is based on certain assumptions about load growth developed by the Ministry of Energy.

Figure 1.3 – Existing and Target Supply Mix



Source: Ministry of Energy, *Backgrounder: Ontario's Electricity Supply Mix*, June 13, 2006.

There were a number of other key elements in the Minister's statement. These included: initiatives to be undertaken by Ontario Power Generation (OPG) on new nuclear units and nuclear refurbishments; advancement of transmission development for the Bruce area; and directives to the OPA on planning for the replacement of coal-fired generation units, increasing the amount of electricity drawn from renewable sources, and increasing conservation targets.

With the Minister's response to the *Supply Mix Advice Report*, the stage is now set for the OPA to begin consultations with consumers and stakeholder groups, leading to preparation of the first IPSP.

1.2 Regulatory Review of the IPSP and Related Projects

The IPSP must be filed with the OEB for review and approval. The OEB is an independent body that performs many functions through adjudicative processes and public hearings. The Board's task in reviewing the IPSP is to determine whether it complies with Government directives and is economically prudent and cost effective.

The projects that are addressed in the IPSP, as distinct from the plan itself, still need to obtain all the required approvals, including environmental approvals, that were previously required, whether federal, provincial or municipal as the case may be.

The regulation governing the plan (O.Reg. 424/04, as amended) specifically requires the IPSP to provide a "sound rationale" for certain projects that are recommended in the plan. This rationale must include an analysis of the natural environmental impact of the project and the alternatives to the project.

The projects for which the OPA must undertake this analysis fit the following criteria. First, they are the ones that currently require an "individual" as distinct from other environmental assessment processes under the *Environmental Assessment Act*, such as "class" assessments and the projects that must go through an environmental screening process under the electricity projects regulation (O.Reg. 116/01). Second, the projects meeting the first criterion must also have a completion date recommended in the IPSP that would require an application for the individual environmental assessment within five years of the approval of the IPSP by the OEB.

The rationale for each of these projects, including the high-level environmental impact, will be considered within the context of an integrated planning process in which the opportunity is available for broad stakeholder involvement. The detailed impacts of each of these projects will be considered when routes or sites, technologies and construction methods are determined and the project proponent makes application for approval under the *Environmental Assessment Act*.

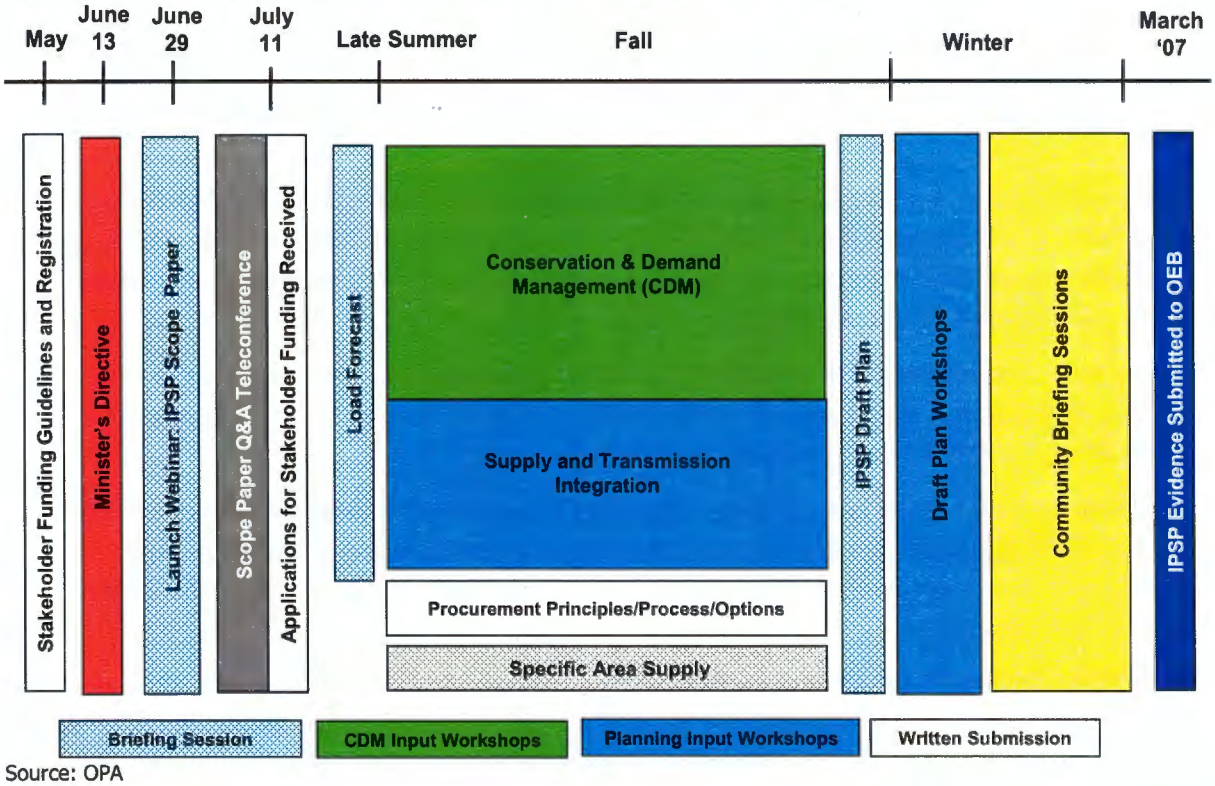
Project proponents will be assisted by the IPSP determination of rationale and consideration of alternatives when they prepare subsequent applications for their project approvals.

1.3 The Proposed Stakeholder Engagement Process

The IPSP stakeholder engagement process will begin in mid-summer and continue until approximately December, as illustrated in Figure 1.4.

The purposes of the process are to exchange information, focus the discussion of planning issues and receive the benefit of early stakeholder comments.

Figure 1.4 – Proposed IPSP Stakeholder Engagement Plan



Source: OPA

The proposed process will follow the format and principles used for the Supply Mix Advice Report and are intended to build on the results from many other public consultations on energy and electricity issues. Figure 1.5 provides a listing of related consultations.

These and other processes have addressed, or are addressing, specific aspects of electricity infrastructure. The IPSP process will strive to build on the results of these processes rather than duplicate them. In addition, the IPSP stakeholder engagement process will consider topics within the scope of the ministerial directive on the IPSP and will incorporate findings from any future consultation processes by the Canadian Nuclear Safety Commission's review of planning, design and siting criteria relative to nuclear generation sites and the environmental assessment approvals under the federal *Environmental Assessment Act*.

The OPA will ensure the plan adequately addresses the requirements in the regulation that environmental sustainability be considered. Given that there is no widely accepted definition of environmental sustainability, the OPA will undertake evaluations of the plan against relevant indicators of social, economic and environmental impacts that are generally addressed under sustainability. We look to stakeholders to share their views on this and other evaluation matters.

The OPA is committed to having a meaningful stakeholder engagement process. In 2005, the OPA developed a set of principles to guide the supply mix consultations. Given the stakeholder

feedback, the OPA believes these principles are valid and appropriate to adopt going forward. The principles are: relevance, transparency, inclusiveness, accessibility, contribution and disciplined and fair management. Appendix 3 describes these principles and how the OPA proposes to implement them in the IPSP stakeholder engagement process.

Figure 1.5 – Public Consultations on Energy and Electricity – Some Examples

- OEB's consultation process on issues related to natural gas use in power generation
- Nuclear Waste Management Organization's four year process of public consultations on disposal options
- Ontario government's public consultations on the OPA's supply mix recommendations in early 2006
- Canadian Nuclear Safety Commission's framework for public consultation, risk management and Environmental Assessment review under the Canadian *Environmental Assessment Act*
- Natural Resources Canada's consultations on efficiency and sustainability in roundtables and other forums
- IESO's consultations on market development
- National Energy Board's public processes on market assessments and natural gas outlooks

Source: OPA

The stakeholder engagement process begins with this paper and, specifically, the proposed planning principles and delineation of key issues given later in the document.

The OPA proposes to establish several parallel work streams, organized into engagement "modules" by subject matter. These streams will be informed by separate issue documents and supporting technical papers.

Modules requiring more comprehensive stakeholder input are designed to be delivered in three stages:

- A preliminary web-enabled briefing session will take place first. The purpose of the briefing session is to provide stakeholders with an overview of the subject matter within the planning context, and further review the proposed planning approach. This briefing session will permit all stakeholders to participate, from industry experts to the general public.
- Following the briefing event, working group sessions will be conducted to deal with specific planning and regulatory issues as identified by both the OPA and stakeholders. As the work progresses, it may become necessary to schedule additional sessions. The engagement plan is flexible to adapt to this need.
- A closing web-enabled summary session is planned to round out the subject area module. The purpose of this session is to summarize all stakeholder input pertaining to the subject area, including the findings and outcomes of the technical working group sessions. Again,

this summary session will permit all stakeholders to participate.

About half-way through the stakeholder process, the results from the work streams will be pulled together and assessment of the "integrated picture" will begin. This, in effect, will be the integration stage. At this point, the engagement plan is flexible regarding the number of workshops that may be required to discuss alternative draft proposals.

The OEB is expected to issue guidance on filing requirements for the IPSP and may have its own stakeholder consultation process related to those guidelines.

1.4 Proposed Planning Principles

The IPSP will comply with all applicable directives, regulations and standards. The plan will consider environmental protection requirements, environmental sustainability, safety, cost and meet all established reliability and planning standards including those of the North American Reliability Council (NERC), the Northeast Power Co-ordinating Council (NPCC) and the IESO. In addition to being compliant, the IPSP will be guided by the following principles stated or implied in the legislation.

- ***Open and Transparent:*** The IPSP will be developed in an open and transparent way to facilitate stakeholder involvement and meaningful consultations. The plan and all supporting documents and evidence will be publicly available, unless specifically prohibited by law, and public input will be invited and considered.
- ***Balanced and Thorough:*** The IPSP will be comprehensive and will provide a balanced and thorough evaluation of the options, including conservation, new supply and transmission solutions, short-term versus long-term considerations, various attributes of the plan and the risks and opportunities. Appropriate detail in assessments will be provided.
- ***Flexible:*** Economic, political and technological conditions will inevitably change, sometimes more rapidly than assumed, and sometimes in completely unforeseen ways. The IPSP will be reviewed on a regular cycle and will be amended as the electricity outlook and risks are reassessed. It will include sufficient measures to be robust enough to withstand minor changes in circumstances and flexible enough to accommodate change when necessary.
- ***Build on Established foundations:*** The IPSP will rely on previous relevant outcomes of public discussions on energy and the environment, on previous relevant assessments and analyses, and on policy decisions and directives.

Part 2. An Overview of the Implementation Challenges

The IPSP is a plan to implement policy. The Government has established policy targets and issued directives. The plan will ensure those targets are met by identifying the timing and location of required electricity sector investments. It will:

- plan for the achievement of demand-side targets
- define the procurement process for new generation
- provide the rationale for required transmission and generation investments, and
- consider safety, environmental protection and environmental sustainability.

The plan will be implemented in the context of an industry that continues to change and an economy that continues to grow.

While its purpose is to reduce uncertainty as much as possible for the benefit of investors and consumers, the plan will address uncertainty by testing alternative scenarios, assessing risks and being flexible. This will require making a wide variety of assumptions about the medium and longer term.

This part of the paper discusses implementation challenges that need to be addressed in the IPSP. The challenges are organized and presented under eight headings, representing the major priorities that will be addressed in the IPSP, such as conservation, renewables and local area reliability. The implementation challenges in each area are presented as matters that the OPA and stakeholders need to work on in coming months in order to develop the IPSP. A basic question for the consultation will be: Have we adequately identified and scoped the implementation challenges?

The OPA is seeking ideas and advice from consumers and stakeholders on these challenges and on the more specific questions and observations made in this Part.

2.1 Overcoming the Infrastructure Deficit

Ontario's electricity situation has been well documented.[3] Province-wide consumption continues to grow. There has been almost no increase in net generation capacity in the past decade. Conservation and demand management programs were largely closed down in the early 1990s. There have been no significant long distance transmission additions since the 1980s. The province has gone from being a significant exporter of power to being a net importer. Risk to reliable service to urban areas at peak times has increased. The system peak has shifted to summer from winter, further straining transmission and generation capacities. Reliable operation of the system on peak summer days has become increasingly challenging and the use of emergency control actions has become more frequent.

[3] OPA, *Supply Mix Advice Report*, December 2005; and Electricity Conservation and Supply Task Force. *Tough Choices: Addressing Ontario's Power Needs. Final Report to the Minister*, January, 2004

Looking ahead, the coal-fired generation, which supplies upwards of 20 percent of Ontario's power, is to be replaced. Units in the nuclear fleet, which supplies approximately half of Ontario's load, start reaching their planned retirement dates as early as 2014. A serious shortfall of supply begins to emerge in about eight years and grows to a gap of about 10,000 megawatts (MW) by 2025.

Figure 2.1 – Initiatives Underway to Meet Ontario's Electricity Needs

Conservation:

- The Conservation Bureau has launched a number of initiatives such as Cool Savings and Every Kilowatt Counts, and will be launching a series of sector specific initiatives in the second half of 2006 and 2007.
- Under the *Energy Conservation Leadership Act, 2006* ministries, agencies and broader public sector organizations can be required to report on energy consumption and proposed conservation measures.
- The smart meter initiative for 800,000 installations by 2007 is in an advanced stage of development and all homes and businesses in Ontario are scheduled to have time of use meters by 2010.
- Load reduction programs have been expanded to when high prices prevail, not just when emergency conditions exist.
- Many local distribution companies (LDCs) have developed innovative conservation programs, such as cycling air conditioners, often in partnership with the Conservation Bureau.
- The OPA has issued an RFP for 1000 MW of combined heat and power capacity. This distributed generation reduces demand on the integrated power system.

Generation:

- Procurement RFPs for renewables and clean generation will result in 548 MW of wind power by 2008 (206 MW is already in service); OPG's Niagara Tunnel Project will increase the energy production of the Sir Adam Beck Generating Station by 2009.
- Approximately 2800 MW of natural gas-fired generation will be added by 2010 in several projects across Ontario, including in Toronto, Brampton and Sarnia.
- Bruce Power will be proceeding with the refurbishment and restart of Units 1 and 2 of Bruce A, which will deliver 1500 MW when both units are operating in 2010.

Transmission:

- A new 230 kV transmission line is under construction between Niagara and Hamilton. It will improve the ability to increase imports from New York into the GTA.

Source: OPA

Progress is being made. The IESO reports that the outlook for 2006 has improved compared to last summer. More than 600 MW of nuclear, gas-fired and hydroelectric generation and more than 200 MW of wind generation have been installed since last year. Looking to the medium and longer term, there are a number of notable developments as summarized in Figure 2.1.

Notwithstanding this progress, over the next five years it will be important to stay ahead by planning and implementing additional CDM initiatives and supply projects.

The requirement for infrastructure is driven by the growth of demand, as well as the scheduled retirement of nuclear units and the policy on replacing coal-fired generation. The OPA's priority is to gain a better understanding of the drivers of the long-term load forecast and the associated forecast risks.

Consumption and peak load depend on many different variables – population, number of households, income growth, general economic performance, industrial structure, relative prices (especially between electricity and natural gas), the pace at which new energy-using and energy-saving products are introduced and the changing energy intensity of the economy. These variables are themselves difficult to project accurately beyond a year or two. An unexpectedly severe economic downturn could significantly change the electricity planning environment, as it did, for example, in the early 1990s.

For the IPSP, the OPA intends to investigate an additional approach for understanding how and why consumption patterns are changing. The approach focuses on electricity consumption by function, or end use, such as heating, lighting, air conditioning, street lighting and machinery use. Since it disaggregates to the level of specific technologies, this approach offers insight into the impact of various relevant variables on electricity demand growth. For example, with respect to air conditioning, it is possible in principle to estimate how much the demand is increasing. The estimate of demand assesses the volume of space cooling and how much demand is increasing (or decreasing) due to weather and how much it is decreasing as a result of the diffusion of more energy-efficient air conditioning systems. The OPA is undertaking work along these general lines and can benefit from stakeholder advice on forecasting and assessment of resource requirements.

2.2 Maximizing the Benefits of Conservation and Demand Management

The Government has made a commitment to conservation and demand management (CDM) as a priority for meeting Ontario's electricity needs. If CDM is to remain sustainable in the long-term and become the permanent and reliable way to meet electricity demand that the Government desires, a "culture of conservation" will need to be widely embraced in Ontario.

In order to fulfill this commitment and drive this priority, the Government has established aggressive targets for conservation and demand management, with a total reduction in peak demand of 6300 MW by 2025 through CDM. The milestones for the province are:

- near-term reduction of peak demand by 5 percent, or 1350 MW, by 2007

- mid-term achievement of an additional reduction of 1350 MW by 2010
- long-term reduction of a further 3600 MW by 2025.

The CDM portion of the IPSP will be a comprehensive plan to meet the long term targets and will be evaluated and assessed in the same manner as other supply options.

Ontario requires comprehensive action on two broad fronts to ensure that conservation gains are sustainable in the long-term. It requires a transformation of policies and the market for conservation, including a change in consumer attitudes and an increase in the capability to develop and deliver CDM programs aimed at achieving energy and capacity savings in the short to medium term. The two approaches are linked and mutually supportive.

Transforming the Market for Conservation: To achieve the long-term goals, a significant shift of Ontarians' attitudes about energy use and transformation of the market will be necessary. Fostering a "conservation culture" begins with measures that educate consumers gradually about electricity costs and their options to reduce energy use, time of use electricity pricing and targeted incentives to replace energy inefficient appliances with new efficient technologies. Effective market transformation will require removal of legal and policy barriers to conservation. In addition, commodity pricing, tax mechanisms, product incentives, improvements to efficiency standards and upgrades to the Ontario Building Code will play an important role in reducing electricity demand.

Changes in standards are among the most powerful tools for driving energy conservation, but they require complex negotiations leading to regulatory or legislative action. These efforts will complement other CDM developments, notably the introduction of smart meters in all homes and small businesses by 2010, and the tiered pricing that now provides an incentive for consumers to conserve.

The Conservation Bureau is taking a lead role in establishing this new "conservation culture" for Ontario. Figure 2.2 lists conservation targets by sector to which the Conservation Bureau is responding by developing programs and initiatives.

Figure 2.2 – Directives to the Conservation Bureau

- secure up to 100 MW of savings in the low income and social housing sector through education, upgrades for lighting and appliances, and, in coming years, building retrofits
- save up to 250 MW in the residential sector, largely through incentives to improved lighting and air conditioning
- target up to 375 MW of demand response for all sectors
- secure up to 125 MW of demand side management in the industrial and agricultural sector
- save up to 150 MW in the commercial and institutional sectors
- target up to 300 MW in Toronto, to be achieved in collaboration with Toronto Hydro.

Source: OPA

CDM Program Development and Delivery: Ontario needs to foster and build the capability for designing and delivering effective and innovative CDM programs and products and the analytical capability to plan them and review their effectiveness. The CDM industry in Ontario has been relatively dormant for more than a decade. The required enhancements to the CDM program delivery capability include R&D to support development of innovative ways to assist manufacturers, retailers, technology developers and building operators to conserve energy. It also includes educating building contractors and energy managers so they are aware of opportunities for efficiency improvements, and supporting the development of skilled trades such as estimators and installers.

If it is to be successful in targeting and prioritizing CDM initiatives and ensuring the overall effort is prudent and cost-effective, Ontario needs to re-establish its CDM analytical capability. Program development will require analysis on a system-wide basis and the knowledge of CDM potential to meet the goals. In addition, analysis to determine the timing of the amounts, predicting the aggregate effect of the CDM initiatives on the plan and a measure of the aggregate avoided cost would be required.

Program development is multi-faceted. It will require rigorous planning, effective delivery, close monitoring, and evaluation and verification of programs. It also will include analysis of best practice experience for sectors and end users highlighting programs that can deliver the biggest and best targeted results over the next three to five years.

The Conservation Bureau is working to develop rigorous evaluation methods and criteria, and to achieve a good understanding of the CDM programs and experiences of its many partners in the conservation effort. Some studies suggest that introducing an aggressive CDM program could, over the life of the IPSP, quadruple the energy savings that would otherwise occur, while other studies are less optimistic.

The studies that are done on individual CDM initiatives will provide guidance on how to assess the aggregate savings that can be expected. For newly introduced programs, verification of the results will provide confidence in energy savings they deliver and at what cost to the ratepayers. This task, while challenging, is necessary because of the incomplete data on what end users are currently spending on conservation, and the types of energy saving products and services they are buying.

The OPA seeks advice from stakeholders on numerous conservation fronts: the CDM initiatives, screening methodologies, information and analytical capability, and evaluation and verification experiences and the effectiveness of specific policy instruments to enhance conservation.

2.3 Integrating Renewable Resources

Renewable resources are an important pillar of environmental sustainability and will feature prominently in the IPSP.

The Government is committed to significantly raising the proportion of clean and renewable energy sources in Ontario's supply mix. The Minister's June 13 directive requires the IPSP to assist the Government in meeting its target for 2010 of increasing the installed capacity of new renewable energy sources by 2700 MW from the 2003 base, and its target for 2025 of increasing the total capacity of renewable energy sources used in Ontario to 15,700 MW (including existing hydroelectric capacity).

The Government has issued two procurement RFPs on renewable resources. The "Renewables I" RFP resulted in the procurement of 395 MW of wind, small hydro and landfill gas capacity, 216 MW of which is now in commercial operation. The "Renewables II" RFP acquired 975 additional MWs, almost all wind powered; most of it is now expected to be connected in mid-2007 or late 2008. The Government's goals are also addressed in the Standard Offer Program being developed jointly by OPA and the OEB, which offers fixed-term, standard price contracts to essentially all new renewable electricity projects under 10 MW.

The IPSP will contain updated information on the potential for further procurement of renewable resources, including wind, hydro (including pumped storage), biomass and solar power. In addition to providing data, the IPSP will need to address two main issues posed by the shift to more renewable generation.

The first challenge arises from the fact that most of the feasible wind and hydroelectric resources are located great distances from major load centres – in Northern and rural Southern Ontario. Connecting these resources and moving their output to load centres will mean significant investments in new transmission. The planning issues include environmental acceptability, timing and cost. The investments need to be staged and co-ordinated. Remote generation sites will not be developed if transmission is not available, but major transmission investments will not be made until it is clear that economically significant amounts of generation are actually going to be developed. The IPSP will need to consider the alternatives for staging and co-ordinating the needed investments.

The second challenge is that wind is an intermittent generation source. As the amount of wind generation on the system grows, it may become necessary to add additional amounts of hydro, storage, or gas peaking generation in order to complement the wind resources on days, particularly peak use days in the summer, when their output is low. Again, the challenge is not simply to procure more renewable resources; it is to ensure that the additional resources are integrated into the existing system in a way that enhances overall system performance for the benefit of customers. Renewable resources are key to meeting the goals of adequacy and environmental sustainability. Planning helps ensure that reliability and security are maintained for consumers. The OPA seeks advice from stakeholders on issues related to effective integration of renewable resources.

2.4 Proceeding with Nuclear Investments

The Minister's June 13 directive calls upon the OPA to plan for nuclear capacity to meet base-load electricity requirements, limiting the installed in-service capacity of nuclear power over the life of the plan to 14,000 MW. OPG will begin a federal approvals process, including an environmental assessment, for new units at an existing nuclear facility. OPG will also begin a feasibility study on refurbishing its existing facilities at Pickering B, including a review of the economic, technological and environmental aspects of refurbishment.

There are essentially five challenges related to the planning and development of nuclear generation in Ontario.

The first is to work with OPG and the regulatory authorities to obtain the best possible estimates of refurbishment potential and feasible in-service dates for refurbished reactors at Pickering B. The details are critical given the number and length of the required approvals and the highly specialized manpower and materials that go into reactor refurbishment. The existing reactors reach their end-of-service dates within a relatively short period from today in close succession of one another, making for a process that will need to be highly co-ordinated. The decision on Pickering B refurbishments will have implications for transmission capability in the GTA and lead time will be required for planning.

A second challenge will be to complete the approval and licensing processes for new nuclear units. The IPSP will need to anticipate the likely size and location of new nuclear units and consider any transmission investments that might be required as a result.

A third issue is the commercial arrangements that may be associated with nuclear investments, and especially with new nuclear. How financial and technological risk is shared among proponents and other parties may affect the terms under which power is procured and the price risks borne by Ontario electricity consumers.

A fourth issue is technology. The IPSP will not recommend a particular type of nuclear technology. It is up to proponents to decide whether and how to proceed and which technology and supplier to use for the new units.

A fifth issue is the disposal of nuclear waste. How federal legislators propose to deal with this issue is pertinent to the IPSP because the plan is obliged to consider the environmental sustainability of all alternatives.

The OPA seeks input and advice on the challenges related to co-ordination of refurbishments and development of new nuclear, including the timelines associated with meeting the goals.

2.5 Replacing Coal

The Minister's June 13 directive calls upon the OPA to plan for coal-fired generation in Ontario to be replaced by cleaner sources in the earliest practical timeframe that ensures adequate

generating capacity and electrical system reliability in the province. It states that the IPSP must take into account feasible in-service dates for replacement generation and necessary transmission infrastructure and endorses the OPA's recommendation of a "smart gas" strategy. Under a smart gas strategy, gas-fired generation is used primarily in peaking applications and for local reliability.

The first challenge is to secure the needed renewable and gas fired generation. Good progress is taking place. A number of barriers are being addressed. For example, the OEB commenced and is now in the midst of a process to examine issues associated with the ability of Ontario's natural gas market to offer flexible services to meet the growing demands of gas-fired generation. While the implementation of natural gas and renewable resources is proceeding at a high pace, not all projects are going to be in service on their original schedules. Close monitoring of this capacity and the schedules is needed.

Transmission is a second part of the coal replacement strategy. Ontario's electricity system was built to geographically balance large generation centres and large load centres. If production from the 4000 MW Nanticoke facility is not replaced by significant base/intermediate generation in that approximate same area of Ontario, major transmission upgrades will be required. These will be needed to compensate for the altered power flows on the network and to ensure that Ontario continues to have access to imports from New York and Michigan. In short, the implementation challenge is not just to find replacement power; it is also to ensure that system reliability and security can be maintained once the coal-fired plants are closed.

A third issue is additional pollution control for plants that continue to operate. The IPSP will assess the relative costs and benefits of such investments and provide the required recommendations and guidance on implementation to Government.

A fourth issue concerns options for the assets after their closure. It may be appropriate to keep some of the capacity in "mothballed" condition so it can be called upon on short notice if unforeseen contingencies occur. The *Supply Mix Advice Report* noted the potential use of these plants as "strategic reserve". In addition, the IPSP will consider whether the sites can be used for other forms of generation.

2.6 Enhancing Transmission

Transmission connects load and generation over wide geographic areas and provides flexibility to access whichever form of generation is most appropriate at any point in time. By enhancing operational flexibility, a well-designed and maintained transmission network will help to minimize costs, accommodate planned outages and mitigate system contingencies.

As generation and load patterns change, so must transmission. Changes in the location of major generation sources, whether renewable, conventional or out-of-province, can trigger major transmission investments above and beyond what is needed to connect the new resource. New generators alter the electricity flow, and if this leads to a reduced ability to move electricity over one or more paths, a transmission solution may be needed. Integrated planning considers large

generation and transmission investments together, ensuring that total system needs are considered and that a full range of alternative solutions has been identified and evaluated. In Ontario, many players now participate in the power industry, and the IPSP is the mechanism for achieving the needed co-ordination.

The Minister's June 13 directive to the OPA requires the IPSP to strengthen the transmission system to enable the achievement of the Government's supply mix objectives. The directive states that transmission is essential to integrating new supply, notably distant renewable resources, and that transmission enhancements can reduce congestion and promote system efficiency. The directive thus establishes two pillars in addition to reliability for a new transmission planning framework in the IPSP:

- the need for new transmission to integrate new generation should be anticipated, and
- congestion and other barriers to system efficiency should be proactively addressed .

The IPSP will recommend specific transmission investments for the near term, identify transmission options for the medium and longer term and indicate the preparatory work that is required for each alternative. It will identify the need to start route and engineering work on medium-term projects to ensure that they can be brought into service in a shorter time by getting a head start on the long lead times required for approvals. The IPSP, when approved by the OEB, will establish the rationale for transmission investments and will provide a key input into subsequent regulatory proceedings related to the individual transmission projects.

Figure 2.3 – Specific Transmission Challenges

- Increasing the transfer capacity between Thunder Bay and Sault Ste. Marie or Sudbury so that potential power from Manitoba and from new renewable generators in the northwest can be connected to the main transmission grid in the northeast.
- Increasing the transfer capacity between Sault Ste. Marie and Sudbury to accommodate the increased flow from the northwest plus new renewable generation in the Algoma area.
- Improving the transmission system north of Sudbury to reduce or eliminate the need for special protection systems and to accommodate potential generation at several hydroelectric sites on rivers flowing into James Bay.
- Increasing the transfer capacity from Sudbury to Barrie and from Barrie to the GTA.
- Connecting wind capacity in the Bruce area and ensuring that this power, plus increased generation from the refurbished Bruce nuclear units and imports from Michigan, can be reliably delivered to the GTA and other load centres in the Golden Horseshoe area.
- Reinforcing the system east of the GTA to accommodate potential imports from Quebec and renewable development in eastern Ontario and to anticipate future decisions regarding nuclear investment at Pickering and/or Darlington.
- Reinforcing the bulk transmission system inside the GTA to ensure reliability and security.

Source: OPA; Note: Some initiatives may require actions in advance of IPSP because of their critical importance and tight timelines.

A descriptive paper on transmission options is being prepared for the IPSP stakeholder engagement process. The existing transmission system is shown on the map (Figure 2.4). Without judging what is economic and what is not, specific transmission challenges to explore are shown in Figure 2.3.

In the stakeholder engagement process, discussions are expected to focus on three types of issues: routing, technology and timing.

On routing, it will be possible to use existing corridors in some cases. In others, it will be necessary to acquire land and establish completely new routes.

Figure 2.4 – Ontario's Transmission Network

Source: Hydro One Networks

Several new technologies will be explored. For example, direct current (DC) transmission is generally preferred for technical reasons over alternating current (AC) for power transfers over very long distances. However, DC lines are like restricted access highways; there are few on-ramps or off-ramps. It is expensive to connect generators or loads at points along the way because special equipment is needed. This may be a consideration with regard to new transmission from other provinces, since the lines could potentially pass through areas where significant renewable generation is being developed.

The third issue is timing. Projects must be ranked in terms of their priority. While obvious in the abstract, this is a difficult planning challenge in practice because of the staging options that are ordinarily available and because of the uncertainties that surround the configuration and in-service dates for some of the larger generation projects, especially nuclear units.

2.7 Providing Reliable Service to Growing Areas of Ontario

The service capacity is strained in several areas of Ontario.

Downtown Toronto requires additional generation for area supply adequacy and system security. The construction of the Portlands Energy Centre will help address the shortfall. Important relief will also occur through the CDM programs developed by the Conservation Bureau and Toronto Hydro. And there may be further scope for various forms of distributed generation.

Nevertheless, there remains a reliability issue around how to get more power into the downtown core. The core is presently fed by two supply corridors, one from the west and one from the east. In simple terms, neither corridor alone has the ability to serve the entire downtown load. Interruptions of service could potentially occur if a major contingency were to shut down one of the routes.

The solution, in principle, is to construct a third supply corridor into the centre of Toronto. The planning issues to be dealt with in the IPSP relate to the routing, timing and cost of such a solution.

Downtown Toronto is not the only place where the system is especially strained. Load is growing fast throughout the 905 portion of the GTA region as a result of population growth and suburban development. Over the next 10 years, consumption and peak load are both expected to grow about twice as fast as in the rest of the province. The situation in the Kitchener-Waterloo-Cambridge-Guelph area is similar in character to that of the GTA. Other areas where local integrated solutions are needed in the next five years include South Georgian Bay (Collingwood and environs), Windsor-Essex, Woodstock-Brant and Thunder Bay.

The implementation challenge is to assess the needs and alternatives, set priorities and schedule the necessary investments.

2.8 Exploring Options for Sector Development

The IPSP will have to make assumptions about the longer term development of the sector, individual market participants and the planning function itself. Three sets of issues pertaining to the evolution of the sector are pertinent to the IPSP.

The first issue concerns the OPA's principles and processes for procuring new generation and CDM resources. The OPA is required by regulation to identify and develop innovative strategies to encourage and facilitate competitive market-based responses and options for meeting overall system needs and identify measures that will reduce reliance on procurement. This will ensure that, over time, financial risk is transferred from electricity consumers to retailers and generation investors. The questions, for IPSP purposes, are:

- What measures could be undertaken?
- Over what timeframes?

Any implementation strategies developed by the OPA will inevitably have wider implications on how various participants in the sector provide services to consumers.

The second issue concerns the broader context in which procurement activity takes place. More specifically, it concerns the development of competitive wholesale and retail markets. Key questions are how forward markets, including the day ahead market, could be implemented, and how residential customers could receive more timely pricing information and energy saving programs. These are important questions for the medium and longer term, and have to be factored into the IPSP, insofar as they affect scenario development and plan implementation.

The third set of issues concerns the structure of the sector relating to the number and type of participant in both the real time and forward markets including evolution of load serving entities (LSEs). The OEB has begun a consultative process regarding rules for determining payment amounts for the output of certain of OPG facilities.

Discussions about sector development will inevitably touch on the role of various institutions and entities in the sector and their role in moving Ontario to more market based mechanisms.

Conclusion

This document has provided an introduction to the IPSP. It has explained the purposes of the IPSP and described the expectations for it. It has outlined the stakeholder engagement process the OPA plans to employ in developing the IPSP and has proposed a set of planning principles to guide the formulation of the plan elements. It has provided a synopsis of the main issues that need to be addressed in getting to a plan that is comprehensive and truly "integrated".

While the paper has focused on implementation issues, the IPSP is a complex undertaking and there will be significant challenges in explaining the work and the results to the public. Maintaining an open and meaningful stakeholder engagement process is clearly a part of the

answer. The OPA is seeking comments from consumers and stakeholders on the many issues that will be considered as the IPSP is developed in the coming months.

Notes:

Appendix 1: Legislation and Regulations

This section provides source material and links to the legislative and regulatory framework underlying the development of the IPSP. The sources of the authority are identified and selected parts are quoted verbatim. There are two major pieces of legislation that apply: The *Electricity Act, 1998*, as amended by the *Electricity Restructuring Act*, 2004, and the *Ontario Energy Board Act*, 1998. Each of these Acts has Regulations associated with them.

The Electricity Act, 1998 – IPSP Portions

The legislative framework for the IPSP is found in s.25.30 of the *Electricity Act*, as follows:

Integrated power system plan

25.30 (1) Once during each period prescribed by the regulations, or more frequently if required by the Minister or the Board, the OPA shall develop and submit to the Board an integrated power system plan,

(a) that is designed to assist, through effective management of electricity supply, transmission, capacity and demand, the achievement by the Government of Ontario of,

(i) its goals relating to the adequacy and reliability of electricity supply, including electricity supply from alternative energy sources and renewable energy sources, and

(ii) its goals relating to demand management; and

(b) that encompasses such other related matters as may be prescribed by the regulations. 2004, c. 23, Sched. A, s. 34.

Minister's directives

(2) The Minister may issue, and the OPA shall follow in preparing its integrated power system plans, directives that have been approved by the Lieutenant Governor in Council that set out the goals to be achieved during the period to be covered by an integrated power system plan, including goals relating to,

(a) the production of electricity from particular combinations of energy sources and generation technologies;

(b) increases in generation capacity from alternative energy sources, renewable energy sources or other energy sources;

(c) the phasing-out of coal-fired generation facilities; and

(d) the development and implementation of conservation measures, programs and targets on a system-wide basis or in particular service areas. 2004, c. 23, Sched. A, s. 34.

Publication

(3) A directive issued under subsection (2) shall be published in The Ontario Gazette. 2004, c. 23, Sched. A, s. 34.

Review of integrated power system plan

(4) The Board shall review each integrated power system plan submitted by the OPA to ensure it complies with any directions issued by the Minister and is economically prudent and cost effective. 2004, c. 23, Sched. A, s. 34.

Board's powers

(5) After review, the Board may approve a plan or refer it back with comments to the OPA for further consideration and resubmission to the Board. 2004, c. 23, Sched. A, s. 34.

Deadline for review

(6) The Board shall carry out the review of an integrated power system plan under subsection (4) within such time as the Minister directs. 2004, c. 23, Sched. A, s. 34.

Ontario Regulation 424/04 (as amended by Ontario Regulation 277/06) – IPSP

The regulation dealing with the IPSP is Ontario Regulation 424/04, which has been amended by Ontario Regulation 277/06, as follows:

Integrated Power System Plan

Period and updating of integrated power system plan

1. For the purpose of section 25.30 of the Act, the OPA,

(a) shall develop and submit an integrated power system plan that covers a period of 20 years from the date of its submission; and

(b) shall develop and submit an update of the plan every three years, which updated plan shall cover a period of 20 years from the date of its submission. O. Reg. 424/04, s. 1.

Development of integrated power system plan

2. (1) In developing an integrated power system plan under subsection 25.30 (1) of the Act, the OPA shall follow directives that have been issued by the Minister under subsection 25.30 (2) of the Act and shall do the following:

1. Consult with consumers, distributors, generators, transmitters and other persons who have an interest in the electricity industry in order to ensure that their priorities and views are considered in the development of the plan.

2. Identify and develop innovative strategies to accelerate the implementation of conservation, energy efficiency and demand management measures.

3. Identify opportunities to use natural gas in high efficiency and high value applications in electricity generation.

4. Identify and develop innovative strategies to encourage and facilitate competitive market-based responses and options for meeting overall system needs.

5. Identify measures that will reduce reliance on procurement under section 25.32 of the Act.

6. Identify factors that it must consider in determining that it is advisable to enter into procurement contracts under subsection 25.32 (1) of the Act.

7. Ensure that safety, environmental protection and environmental sustainability are considered in developing the plan.

8. Ensure that for each electricity project recommended in the plan that meets the criteria set out in subsection (2), the plan contains a sound rationale including,

i. an analysis of the impact on the environment of the electricity project, and

ii. an analysis of the impact on the environment of a reasonable range of alternatives to the electricity project.

(2) For the purposes of paragraph 8 of subsection (1), the following are the criteria:

1. An environmental assessment of the electricity project under Part II of the Environmental Assessment Act must be required.

2. The electricity project, based on the recommended date for completion of the project in the plan, will in the opinion of the OPA require that an application for approval for an undertaking be made under the Environmental Assessment Act within five years after the approval of the plan by the Board.

(3) In this section,

"electricity project" means a project that includes one or more of a transmission line, generation facility, transformer station or distribution station;

"environment" means air, land, water, plant life and animal life, including human life and "environmental" has a corresponding meaning.

Publication of plan

3. The OPA shall publish all integrated power system plans that have been approved by the Board under subsection 25.30 (5) of the Act on a publicly accessible website approved by the Board. O. Reg. 424/04, s. 3.

4. Omitted (provides for coming into force of provisions of this Regulation). O. Reg. 424/04, s. 4.

The Electricity Act, 1998 – Procurement Portions

With respect to the OPA's procurement process, the legislative framework is found in s.25.31 and sec. 25.32 of the *Electricity Act*, as follows:

Procurement process for electricity supply, etc.

25.31 (1) The OPA shall develop appropriate procurement processes for managing electricity supply, capacity and demand in accordance with its approved integrated power system plans. 2004, c. 23, Sched. A, s. 35.

Same

(2) The OPA's procurement processes must provide for simpler procurement processes for electricity supply or capacity to be generated using alternative energy sources or renewable energy sources, or both, where the supply or capacity or the generation facility or unit satisfies the prescribed conditions. 2004, c. 23, Sched. A, s. 35.

Application for approval

(3) The OPA shall apply to the Board for approval of its proposed procurement processes, and any amendments it proposes. 2004, c. 23, Sched. A, s. 35.

Board approval

(4) The Board shall review the OPA's proposed procurement processes and any proposed amendments and may approve the procurement processes or refer all or part of them back with comments to the OPA for further consideration and resubmission to the Board. 2004, c. 23, Sched. A, s. 35.

Deadline for review

(5) The Board shall carry out the review of the proposed procurement processes and any proposed amendments within such time as the Minister directs. 2004, c. 23, Sched. A, s. 35.

25.32 (1) When the OPA considers it advisable, it shall enter into contracts in accordance with procurement processes approved under section 25.31 for the procurement of,

(a) electricity supply or capacity, including supply or capacity to be generated using alternative energy sources, renewable energy sources or both; or

(b) measures that will manage electricity demand or result in the improved management of electricity demand on an on-going or emergency basis. 2004, c. 23, Sched. A, s. 36.

Contract to comply with regulations

(2) The OPA shall not enter into a procurement contract that does not comply with the regulations. 2004, c. 23, Sched. A, s. 36.

Resolution of procurement contract disputes

(3) The parties to a procurement contract shall ensure that the contract provides a mechanism to resolve any disputes between them with respect to the contract. 2004, c. 23, Sched. A, s. 36.

Transition

(4) Despite subsection (2), the Minister may direct the OPA to assume, as of such date as the Minister considers appropriate, responsibility for exercising all powers and performing all duties of the Crown, including powers and duties to be exercised and performed through an agency of the Crown,

(a) under any request for proposals, draft request for proposals, another form of procurement solicitation issued by the Crown or through an agency of the Crown or any other initiative pursued by the Crown or through an agency of the Crown,

(i) that was issued or pursued after January 1, 2004 and before the Board's first approval of the OPA's procurement process under subsection 25.31 (4), and

(ii) that relates to the procurement of electricity supply or capacity or reductions in electricity demand or to measures for the management of electricity demand; and

(b) under any contract entered into by the Crown or an agency of the Crown pursuant to a procurement solicitation or other initiative referred to in clause (a). 2004, c. 23, Sched. A, s. 36.

Release of the Crown, etc.

(5) As of the day specified in the Minister's direction under subsection (4), the OPA shall assume responsibility in accordance with that subsection and the Crown and any Crown agency referred to in that subsection are released from any and all liabilities and obligations with respect to the matters for which the OPA has assumed responsibility. 2004, c. 23, Sched. A, s. 36.

Deemed compliance

(6) The following contracts shall be deemed to be procurement contracts entered into in accordance with any integrated power system plan and procurement process approved by the Board:

1. A contract entered into by the OPA following a procurement solicitation or other initiative referred to in clause (4) (a).

2. A contract referred to in clause (4) (b). 2004, c. 23, Sched. A, s. 36.

Same

(7) The OPA shall enter into any contract following a procurement solicitation or other initiative referred to in clause (4) (a) if directed to do so by the Minister of Energy, and that contract shall be deemed to be a procurement contract that was entered into in accordance with any integrated power system plan and procurement process approved by the Board. 2004, c. 23, Sched. A, s. 36.

Ontario Regulation 426/04 — Procurements

Ontario Regulation 426/04 provides as follows:

Ontario Power Authority Procurement Process

Assessment of capability of IESO-administered markets

1. The OPA shall not commence the procurement process under section 25.32 of the Act unless it has, in consultation with interested parties, made an assessment of the capability of the IESO-administered markets to, or the likelihood that investment by other persons will,

(a) meet the need for electricity supply or capacity as identified in an assessment made under section 25.29 of the Act; or

(b) deliver measures that will manage electricity demand or result in the improved management of electricity demand as described in clause 25.32 (1) (b) of the Act. O. Reg. 426/04, s. 1.

Factors for consideration

2. The OPA shall not commence the procurement process under section 25.32 of the Act unless,

(a) it has considered the factors identified in the integrated power system plan in respect of the advisability of entering into contracts; or

(b) in the opinion of the OPA, after consultation with the IESO, extraordinary circumstances exist that justify proceeding with a procurement process without consideration of the factors mentioned in clause (a). O. Reg. 426/04, s. 2.

Principles in the procurement process

3. In developing procurement processes under section 25.31 of the Act, the OPA shall comply with the following principles:

1. Procurement processes and selection criteria must be fair and clearly stated and, wherever possible, open and accessible to a broad range of interested bidders.

2. To the greatest extent possible, the procurement process must be a competitive process.

3. There must be no conflicts of interest or unfair advantage allowed in the selection process.

4. To the greatest extent possible, the procurement process must not have an adverse impact outside of the OPA procurement process on investment in electricity supply or capacity or in measures that will manage electricity demand as described in subsection 29.32 (1) of the Act. O. Reg. 426/04, s. 3.

No adverse impact of contract

4. The OPA shall ensure that, to the greatest extent possible, any contract it enters into under subsection 25.32 (1) of the Act does not contain any terms or conditions that have an adverse impact on investment by persons who are not parties to such a contract with the OPA in electricity supply or capacity or in measures that will manage electricity demand as described in subsection 29.32 (1) of the Act. O. Reg. 426/04, s. 4.

5. Omitted (provides for coming into force of provisions of this Regulation). O. Reg. 426/04, s. 5.

Appendix 2: Ministerial Directive

Minister of Energy
Hearst Block, 4th Floor
900 Bay Street
Toronto ON M7A 2E1
Tel.: 416-327-6715
Fax: 416-327-6754

Ministre de l'Énergie
Édifice Hearst, 4e étage
900, rue Bay
Toronto ON M7A 2E1
Tél.: 416-327-6715
Téléc.: 416-327-6754

Ontario

June 13, 2006

Mr. Jan Carr
Chief Executive Officer
Ontario Power Authority
1600-120 Adelaide Street West
Toronto, Ontario
M5H 1T1

Dear Mr. Carr:

Re: Integrated Power System Plan

As authorized by the Lieutenant Governor in Council under Section 25.30 of the *Electricity Act, 1998*, I am providing direction for the preparation of the Integrated Power System Plan.

The Government directs the OPA to create an Integrated Power System Plan to meet the following goals:

1. The goal for total peak demand reduction from conservation by 2025 is 6,300 MW. The plan should define programs and actions which aim to reduce projected peak demand by 1,350 MW by 2010, and by an additional 3,600 MW by 2025. The reductions of 1,350 MW and 3,600 MW are to be in addition to the 1,350 MW reduction set by the government as a target for achievement by 2007. The plan should assume conservation includes continued use by the government of vehicles such as energy efficiency standards under the *Energy Efficiency Act* and the Building Code, and should include load reduction from initiatives such as: geothermal heating and cooling; solar heating; fuel switching; small scale (10 MW or less) customer-based electricity generation, including small scale natural gas fired co-generation and tri-generation, and including generation encouraged by the recently finalized net metering regulation.

2. Increase Ontario's use of renewable energy such as hydroelectric, wind, solar, and biomass for electricity generation. The plan should assist the government in meeting its target for 2010 of increasing the installed capacity of new renewable

energy sources by 2,700 MW from the 2003 base, and increase the total capacity of renewable energy sources used in Ontario to 15,700 MW by 2025.

3. Plan for nuclear capacity to meet base-load electricity requirements but limit the installed in-service capacity of nuclear power over the life of the plan to 14,000 MW.

4. Maintain the ability to use natural gas capacity at peak times and pursue applications that allow high efficiency and high value use of the fuel.

5. Plan for coal-fired generation in Ontario to be replaced by cleaner sources in the earliest practical time frame that ensures adequate generating capacity and electricity system reliability in Ontario.

   The OPA should work closely with the IESO to propose a schedule for the replacement of coal-fired generation, taking into account feasible in-service dates for replacement generation and necessary transmission infrastructure.

6. Strengthen the transmission system to:

   - Enable the achievement of the supply mix goals set out in this directive;
   - Facilitate the development and use of renewable energy resources such as wind power, hydroelectric power and biomass in parts of the province where the most significant development opportunities exist;
   - Promote system efficiency and congestion reduction and facilitate the integration of new supply, all in a manner consistent with the need to cost effectively maintain system reliability.

7. The plan should comply with Ontario Regulation 424/04 as revised from time to time.

Yours sincerely,

Dwight Duncan
Minister of Energy

Appendix 3: Stakeholder Engagement Principles for the IPSP

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Relevance – Actively engaging parties who are affected by OPA activities. By clearly stating the topic and purpose of each activity, stakeholders themselves will be able to determine their necessary level of participation throughout the engagement program. Different channels will be utilized at various points within the engagement plan to suit the scope of consultation.

Transparency – Ensuring that the stakeholder engagement process and outcomes are openly shared. Appropriate communication of all activities, sharing of written summaries of proceedings, follow-up, written submissions, questions and comments will be posted to the IPSP website www.powerauthority.on.ca. Active utilization of electronic communication channels will facilitate and maintain an increased level of transparency.

Inclusiveness – Ensuring that all those who want or need to be, are included. Stakeholder participation will be further facilitated by OPA's provision of funding as approved per OEB's February 13th, 2006 Decision in EB-2005-0489. Funding guidelines and protocol can be found on the OPA website through the following link: www.powerauthority.on.ca.

Accessible – Ensuring that appropriate information is available in a timely fashion through multiple channels including face-to-face working sessions and web-enabled technical and information briefings. All materials relevant to the engagement plan will be available on the OPA website prior to specific events when required and posted when available. Web-enabled conference material (including an audio recording of the session) will also be available on the website for access by participants unable to attend the event on the scheduled date and time. Additionally, scheduling considerations for other industry consultations are being made as can best be accommodated given the nature of the working timelines for the project.

Meaningful Contribution – Ensuring that stakeholders have the opportunity to participate in the process to the degree they deem appropriate. The IPSP engagement plan has been designed to focus on the content of the plan as specified in statute and regulation, and outlined in directives from the Minister of Energy. The engagement is further intended to ensure consistent delivery of facts and information to participants so that a more fulsome understanding of the range of electricity planning issues and their interrelationships is achieved. Stakeholders are encouraged to share their perspectives and contribute in areas of their choosing.

Disciplined and Fair Management – Through practice of effective process leadership ensure that the stakeholder engagement process is managed efficiently and effectively. All participants are treated with equal standing and with mutual respect, recognizing that representation will be made from a diversity of viewpoints. Specific engagement activities will require participants to consider the "Participant Terms of Reference" (attached and also available on the OPA website).

Source: OPA

Notes:

Ontario Power Authority

120 Adelaide Street West
Suite 1600
Toronto, ON M5H 1T1
Phone: (416) 967-7474
Fax: (416) 967-1947
www.powerauthority.on.ca

For information about the Integrated Power System Plan:
E-mail: IPSPinfo@powerauthority.on.ca
Phone: (416) 969-6072